Time-Trol

BULLETIN 1272

NEW solid state PROGRAMMABLE TEMPERATURE CONTROLLER

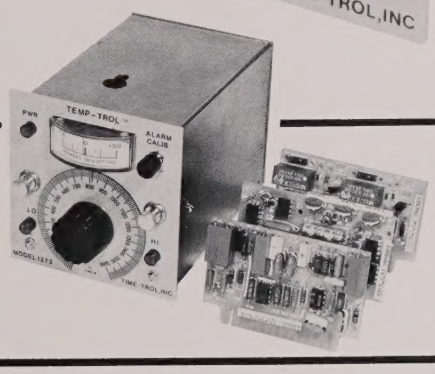
with features available in only much higher priced units . . . plus some unique functions exclusively ours

- **3-Way Set Point Control**
  (a) Command from a remote 0-10 VDC Program Signal.
  (b) Local Analog Setting or Digital Setting of Control Point.
  (c) An integral Manual Percent Setting to regulate output.
- **3-Mode Control Output (4-20MA)** with adjustable Proportional Band, Rate and Automatic Reset.
- **Analog Process and/or Deviation Indicator**
- **Process Output Signal, 0-10 VDC,** for remote monitoring
- **Deviation Output Signal, ±10 VDC,** for remote monitoring
- **Digital Process Indication**
- **Hi & Lo Alarms**
- **Power On LED**
- **Trimly packaged in ¼ DIN Case**
- **Panel Rack Mount also**
- **Adaptable for other Process Sensors,** i.e.: strain gage, LVDT, MA & MV
- **Super Warranty** Unconditional satisfaction for One Year from date of shipment if not subjected to mis-application, damage or installation error. Repair/Replace or Refund.

RECOMMENDED APPLICATIONS

SCR Power Regulation	Molding Presses
Multi-zone Furnaces	Process Tanks
Ovens, Platens	Duct Heaters
Quartz Heaters	Test Chambers
Textile Dyeing	Die Casting
Heat Sealers	Packaging Machines

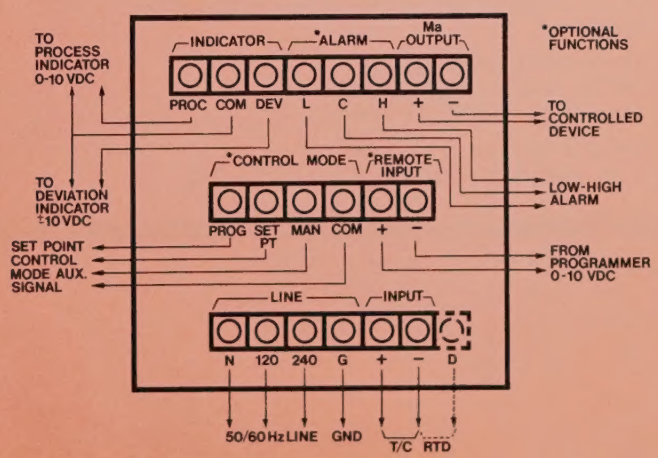
The Model 1272 Temp-Trol™ in one of its many available configurations



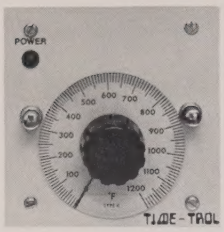
Replaceable Boards for maximum flexibility and easy servicing.

Mother board concept, common to basic model, permits a wide range of selectability of optional functions from standard satellite boards.

Rear Terminal Board

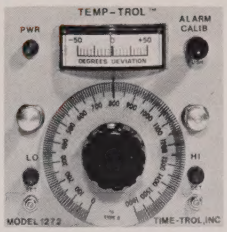


ANALOG SET POINT MODELS



1272-L-A-112-J-I-X-1
Analog Set Point.

1272-L-C-112-J-I-X-1
Analog Set Point
Deviation Indicator.



1272-P-C-112-J-I-A-1
Analog Set Point
Deviation Indicator
Programmable Set Point
Hi & Lo Alarms

DIGITAL SET POINT MODELS

1272-L-D-120-K-I-X-1
Digital Set Point
Process Indicator

1272-L-E-120-K-I-X-1
Digital Set Point
Digital Process Indicator
Analog Deviation Ind.

1272-P-E-120-K-I-A-1
Digital Set Point
Digital Process Indicator
Analog Deviation Ind.
Programmable Set Point
Hi & Lo Alarms

MODEL 1272 Temp-Trol™

SPECIFICATIONS (*Optional Features)

SET POINT:
Analog — 6.5" scale, 300° Rotation
Digital — Push-to-set button displays set point on digital process indicator for settability to one degree

ACCURACY:
Calibrated — ±0.5% SPAN
Repeatability — ±0.2% SPAN

THERMOCOUPLE LEAD RESISTANCE:
200 ohms or less for best accuracy

SENSOR BREAK PROTECTION:
Upscale standard, downscale optional

AMBIENT TEMP. RANGE:
30°F to 130°F (0 to 55°C)

SUPPLY VOLTAGE:
120 or 240 volts, +10%, -15%, 50/60 Hz

PROCESS SIGNAL OUTPUT:
0-10 VDC over full span

DEVIATION SIGNAL OUTPUT:
±10 VDC for ±10°, ±20°, or ±50° depending on span
(*Integral Deviation Indicator)

PROPORTIONAL CONTROL OUTPUT SIGNAL:
4-20 MA, 3 mode control; proportional band (0 to 30% of span), rate (0 to 2 minutes), automatic reset (0 to 10 repeats per minute)

***ALARM:**
Low and high alarm settable for full span with LED indication of alarm

***SET POINT CONTROL MODE SELECTOR:**
Programmable from 0-10 VDC input signal
Automatic from integral Analog or Digital Set Point
Manual for integral Percent Power adjustment
Output indication of control mode selection for logic or interlock use

DIMENSIONS — ¼DIN: Overall,
3-7/8" (99mm) H, 3-7/8" (99mm) W, 6" (152mm) D;
Cutout, 3-5/8" x 3-5/8" (92 x 92mm)

RACK MOUNT:
4.6" (117mm) H, 2.7" (68mm) W, 6" (152mm) D

ORDERING CODE

1 2 7 2-P-D-1 2 0-K-1-X-2

I BASIC MODEL — 1272

II SET POINT — P

L - Local, P - Programmable, Y - Special

Analog Set Point	Digital Set Point
A - Set Point Only	D - With Process Ind.
C - With Deviation Ind.	E - With Process & Dev. Ind.
	M - Digital Turns Dial & Deviation Ind.

III RANGE (for inputs listed in IV) — D

Analog: °/Div. in ( ) — Digital: 1°/increment,

101 -100-+300°F (5) D/E/T	204 0-400°C (5) J
102 0-250°F (2) D/T/J	206 0-600°C (5) J/K
104 0-400°F (5) J	210 0-1000°C (10) K
106 0-600°F (5) J	216 0-1600°C (10) R/S
110 0-1000°F (10) J/K	
112 0-1200°F (10) J/K	301 0-10 MV
116 0-1600°F (10) J/K	305 0-50 MV
120 0-2000°F (20) K	310 0-100 MV
125 0-2500°F (20) R/S**	399 SPECIAL

**analog only

IV INPUT — 1

D - RTD, 100 Ohms, 3 wire, STD.	K - Chromel Alunel
E - Chromel Constantan	R - Platinum 13% Rhodium
T - Copper Constantan	S - Platinum 10% Rhodium
J - Iron Constantan	M - Millivolt
	Y - Special

V OUTPUT — 2

1 - 4-20 MA STD	3 - On-Off Adjustable Deadband to Drive Solid State Relay
2 - 0-10 VDC	4 - Time-Proportioning, 3-Mode to Drive Solid State Relay
9 - SPECIAL	

V ALARM — X

X - NONE
A - Low & High, Process Adjustable, 2A. 120 VAC (Standard)
B - Low & High, Deviation Adjustable, 2A. 120 VAC

VII PACKAGING — 1

1 - ¼ DIN Enclosure
2 - Panel mount Rack
9 - Special

Subject to change without notice.

Represented By:

Time-Trol
7732 BURNET AVENUE, VAN NUYS, CALIFORNIA 91405
(213) 781-3202 873-5151 • (TLX 6-74300)

AUTOMATIC
CONTROL
SYSTEMS
AND
COMPONENTS

Time-Trol

MODEL 1172

PROGRAMMABLE

TEMPERATURE CONTROLLER

INSTRUCTIONS

7732 BURNET AVENUE ☐ VAN NUYS, CALIFORNIA 91405 ☐ (213) 781-3202 873-5151 ☐ (TLX 6-74300

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I. APPLICATION

The Model 1172 Temperature Controller provides a proportional, three mode, milliamp output suitable for driving SCR power controllers and other devices requiring a proportioning command signal.

The Model 1172 is available for use with thermocouple, RTD or millivolt inputs and operates from a 120 or 240 line voltage source.

Typical application for this temperature controller are the control of furnaces and ovens, creep test furnaces, laboratory test equipment, synthetic fiber processing and diffusion furnaces used in the semiconductor industry.

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II. SPECIFICATIONS

A. INPUT RANGES -

The 1172 temperature controller is available in various ranges with different inputs; refer to bulletin 1172.

Calibrated inputs are available for thermocouple types B, E, J, K, R, S, T. Inputs are available using 100 ohm RTD's. Other process inputs may be accommodated from 0-10 millivolts to 0-10 volts.

B. INPUT IMPEDANCE - 500 ohms.

C. SENSOR BREAK PROTECTION -

Standard upscale on thermocouple or millivolt models. Can be converted to downscale or none upon special request.

D. CONTROL SENSITIVITY -

±2 microvolts nominal for thermocouple or millivolt models.

E. SET POINT - Analog or digital.

1. Analog setting to 0.5% of range (span), 0.2% repeatability.

2. Digital setting in 1^{o} increments, 0.2% of range repeatability.

F. CONTROL FUNCTION -

Three-mode (current proportioning with automatic reset plus rate)

G. OUTPUT - Standard (others available)

4-20 MA dc into 500 ohm maximum load.

H. OPERATING VOLTAGE & FREQUENCY -

120/240 volts, 50/60 HZ. Satisfactory operation is provided between 90% and 110% of rated voltage.

I. POWER CONSUMPTION - 7.5 watts maximum.

J. INDICATOR - Optional

Deviation - $\pm 10^{o}$, $\pm 25^{o}$, $\pm 50^{o}$ depending on input range (span).

Process - indicating of range (span).

K. MOUNTING - Flush by two brackets.

III. 3-MODE CONTROL ADJUSTMENTS

The following adjustments are reached by turning the two unlocking screws at the sides of the instrument face. Turn the LH scres CW and the RH screw CCW and partially slide out the electronic chassis. The adjustment potentiometers are at the top front of the chassis.

A. PROPORTIONAL BAND ADJUSTMENT (PROP BAND) -

1. increasing the prop band increases stability (slow temperature oscillations).

2. increasing the prop band reduces temperature overshoot on start up.

3. decreasing the prop band increases the ability of the controller to respond to load temperature changes.

4. for optimum control, the prop band should be decreased until just before the point where the control becomes unstable. The exception to this general rule is that if overshoot is a problem, it may be desirable to increase the prop band.

B. RATE -

1. too little rate causes a slow system response to process changes.

2. too much rate causes excessive system cycling.

3. optimum rate setting is to have rate time as long as possible without causing cycling action.

C. AUTOMATIC RESET -

1. too much auto reset causes unstable control.

2. too little auto reset causes a slow response to process changes.

3. reset capability allows proportional band setting to be wider, with accompanying added stability, without causing slow response or large offsets. Cycling caused by excessive reset may occur around setpoint with to much rate action. With reset switch in OFF position, no reset action occurs.

NOTE: For proper performance from all dynamic 3-mode adjustments (proportional band, rate, and reset), allow the system time to stabilize after each adjustment.

D. AMBIENT AND RANGE CALIBRATION,- for thermocouple or millivolt input; refer to addendum for other applicable inputs.

1. DVM connected per C1 above.
2. Connect millivolt source to input observing polarity.
3. Set temperature reading millivolt source to 75°F (25°C) or _____ MV DC.
4. Adjust AMB (R35) to read _____ volts DC on DVM.
5. Set millivolt source to maximum range (span).
6. Adjust CALIB (R34) to read _____ Volts DC on DVM.
7. Repeat steps 3 thru 6 until no further adjustments are required.
8. Check DVM readings at 25% of range (_____MV = _____V), 50% of range (_____MV = _____V), 75% of range (_____MV = _____V); readings should be within ±0.5% (_____MV = _____V) of range (span).

E. SET POINT CALIBRATION-

1. Connect DVM to DEV (+) or to PC board point 9 (+) and point 5 (-).

   NOTE: If the instrument is equipped with a deviation meter the DVM is not necessary. The zero reading of the deviation meter may be used.

2. A suitable resistor R16, or a jumper J3, must be installed. The output will be equivalent to ± 10V DC for ± _____°F (°C) or ± _____MV.
3. Set set point to full range (span).
4. Set millivolt source to equivalent full range (span).
5. Adjust range R39 for DVM reading of zero MV.
6. Set set point and millivolt source to corresponding values of 25%, 50%, 75% of range (span) and check that the DVM reading does not exceed 0.5% of span (±_____MV).
7. Set point is now calibrated.

F. MA OUTPUT -

1. Connect a 500 ohm, ¼ watt or large resistor across MA output terminals.

2. Connect DVM to MA OUTPUT on terminal block, observing polarity.

3. Set set point to mid range (50%).

4. Set millivolt source to corresponding value of mid range.

5. On auxillary board set reset switch to OFF, RATE ADJ to minimum (ccw) and PROP BAND to minimum (ccw).

6. DVM sould read approximately 10 volts.

7. At approximately 51% of range on millivolt source DVM should read 0.

8. Set PROP BAND to maximum (cw).

9. DVM should read 0 at approximate 51% of range and approximately 10 volts at 30% of range.

10. With set point set at mid range (50%), millivolt source set to 30% of range, PROP BAND set to maximum (cw) turn reset switch to ON.

11. Set millivolt source to mid range and turn PROP BAND to minimum (ccw), DVM reading will go from 10 volts to 0 volts in about 10 seconds.

12. Proportional Band, Rate and Reset are functioning properly.

MP MASTER
MA34636